



STATE OF  
WASHINGTON

Dixy Lee Ray  
Governor

# DEPARTMENT OF ECOLOGY

7272 Cleanwater Lane, Olympia, Washington 98504

206/753-2353

## M E M O R A N D U M

December 1, 1977

To: Harold Porath

From: Mike Morhous

Re: Ellensburg STP Class II Inspection

In conjunction with the above referenced inspection, additional 24 hour composites were split with the STP and DOE for BOD<sub>5</sub> analysis. The composites were collected by the Ellensburg STP from 0800 October 19th to 0800 October 20th.

The following table provides a comparison of the results.

	DOE		Ellensburg STP		NPDES
		Unchl.		Unchl.	Permit
	Inf.	Eff.	Inf.	Eff.	Limitations
BOD <sub>5</sub> mg/l	114	11	83	7	30
% Reduction		90		92	
lbs/day	2,729	263	1,987	168	1,200

This data completes the above referenced inspection and October 17, 1977 memorandum. If you have any questions feel free to contact me at Scan 8-234-2006.

MM:ee

cc: Central Files  
Dick Cunningham  
Bill Yake



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To: Harold Porath  
From: Mike Morhous  
Re: Ellensburg STP  
Class II Inspection

Date: October 17, 1977

Findings and Conclusions:

On July 20 and 21, 1977 the above referenced inspection was conducted by myself and Tom Merrill. The Ellensburg STP is a secondary activated sludge wastewater treatment facility.

This inspection showed the STP was well within their NPDES effluent limitations. Laboratory procedures were reviewed and no major discrepancies were found. Procedures and techniques appeared to be in order.

It was noted during this inspection that there was no chlorine residual limitation in Ellensburg's NPDES permit. Consideration should be given to include such a limitation. It is further recommended that the permit be more specific as to which chlorine residual is to be reported. It has been assumed by most that chlorine residual refers to total available residual chlorine. However a recent incident showed free available residual chlorine being reported because the NPDES permit did not specify total available residual chlorine.

MM:ee

cc: Dick Cunningham  
Central Files  
Roger Stanley

Sampler	Date and Time Installed	Location
1. Inf.	7/20 at 0920	Headworks outfall
aliquot -250 ml/30 minutes		combined clarifier eff. line
2. Unchl. eff.	7/20 at 0900	
aliquot - 4 second sample/14,000 gals. of flow		
3. Chl. eff.	7/20 at 0925	
aliquot - 250 mls/30 minutes		chlorine contact chamber outfall

#### Grab Samples

	Date and Time	Analysis	Sample Location
1.	7/21 at 0930	Heavy metals	second digester
2.	7/21 at 0930	Fecal coliforms	North 1/2 cont. chamber outfall
3.	" "	" "	South 1/2 " " "
4.			
5.			
6.			

#### Flow Measuring Device

1. Type: In-line Sparling (propeller) flowmeter
2. Dimensions

a. Meets standard criteria ☒ Yes

N/A ☒ No Explain:

STP flow meter was not checked for accuracy

- b. Accuracy check

	Actual Instr. Flow	Recorder Reading	Recorder Accuracy (% of inst. flow)
1.			
2.			
3.			

☒ is within accepted 15% error limitations

☒ is in need of calibration

#### Field Data

Parameter	Date and Time	Sample Location	Result
pH, temp., sp. cond.	7/20 at 1145	Same as inf. compositer	7.3, 16.4°C, 350 umhos/cm
pH, temp., sp. cond.	7/20 at 1200	Same as chl. eff. compositer	7.1, 17.1°C, 345 umhos/cm
pH, temp., sp. cond.	7/20 at 1215	East clar. outfall	7.2, 16.8°C, 320 umhos/cm
pH, temp., sp. cond.	7/20 at 1215	West clar. outfall	7.2, 16.8°C, 320 umhos/cm
Total Resid. chlorine	7/21 at 0930	Cont. chamber outfall	.35 ppm

## Review of Laboratory Procedures and Techniques

On 7/20 laboratory procedures were reviewed with Dan Curry, lab man. The lab runs final effluent BOD<sub>5</sub>s from their unchlorinated effluent composites. The STP sends fecal coliform grab samples to Central Washington University for analysis (MPN method).

### BOD<sub>5</sub>

The lab uses a D.O. meter and probe for determining D.O. and D.O. reductions. The D.O. meter is calibrated to atmospheric pressure once every two days. BOD procedures and results appeared to be in order. However it was recommended that atmospheric calibration of the D.O. meter be compared with a Winkler D.O. to check calibration accuracy. It was further recommended that the D.O. meter be calibrated at the end of each day to check stability of the meter and the possible need for daily calibration.

### TSS

The lab uses Reeves Angel 5.5 cm glass fiber filters. The lab filters 100 ml volumes in usual less than one minute. Recommended increasing sample volume to provide an approximate 3-5 minute filtering time.

The lab uses an amperimetric titrator for chlorine residual analysis. A comparison between my DPD kit and the lab's titrator was as follows: titrator - 0.15 ppm, DPD - 0.3 ppm.

### Fecal Coliforms

As previously expressed, Central Washington University analyzes the STP's coliform samples. The STP calculates their monthly average using an arithmetic mean. It was recommended the STP use a geometric mean procedure in order to comply with their NPDES permit.

Due to a failure of the STP's BOD incubator, a comparison of BOD<sub>5</sub> results could not be obtained as part of this inspection. A subsequent memo will provide these results when they become available.

The following table is a comparison of laboratory results from 24 hour composite(s) together with NPDES permit effluent limitations. Additional results pertinent to this inspection have also been included.

	Ellensburg STP						NPDES (Monthly average)
	Inf.	DOE Unchl. Eff.	Chl. Eff.	Inf.	Unchl. Eff.		
BOD <sub>5</sub> mg/l lbs/day	100	10	8 276				30 1200
TSS mg/l lbs/day	55	5	6 207	89	5		30 1200
Total Plant Flow MGD					4.14		Not to exceed 15
Fecal coliforms (colonies/100 mls) at 0930 N. half at 0930 S. half			< 10 < 10				200
* Total Resid. Chlorine (ppm) at 0930			0.35				

\* Field Analysis

"<" is "less than" and ">" is "greater than"

	Secondary Digester	DOE					NPDES (Monthly Average)
Copper (mg/Kg) (dry wt.)	570						
Lead (mg/Kg) (dry wt.)	370						
Zinc (mg/Kg) (dry wt.)	1890						
Chromium (mg/Kg) (dry wt.)	41						
Nickel (mg/Kg) (dry wt.)	51						
Cadmium (mg/Kg) (dry wt.)	8.2						

\* Field Analysis

"<" is "less than" and ">" is "greater than"

## DEPARTMENT OF ECOLOGY

OLYMPIA LABORATORY

DATA SUMMARY
 ORIGINAL TO:  
 ..M.M.....  
 COPIES TO:  
 ..D.H.....  
 .....  
 LAB FILES...
Source EllensburgCollected By Mc ; McDate Collected 7-21-77

Log Number:

27-4-01 02 03 04 05 \*

Station:	TEMP C/°F	DUML. EFF. C/°F	CHLOR EFF. C/°F	PH	COND C/°F	2 cell Digestor			
pH	7.2	7.2	7.9						
Copper						570.	* RESULTS AS		
Sp. Conductivity (umhos/cm)	410	370	380				mg/kg dry		
COD	150	24	24				Weight (0.81%)		
BOD (5 day)	100	10	8				DRY SOLIDS		
Total Coliform (Col./100 ml)									
Fecal Coliform (Col./100 ml)				<10	<10				
NO <sub>3</sub> -N (Filtered)	0.6	4.5	4.2						
NO <sub>2</sub> -N (Filtered)	<0.2	0.3	0.1						
NO <sub>3</sub> -N (Unfiltered)	5.0	0.9	1.2						
T. Kjeldahl-N (Unfiltered)									
O-PC <sub>4</sub> -P (Filtered)	1.4	1.4	1.2						
Total Phos.-P (Unfiltered)	2.4	1.6	1.6						
Total Solids	295	227	269						
Total Non. Vol. Solids	197	184	204						
Total Suspended Solids	55	5	6						
Total Sus. Non Vol. Solids	9	<1	<1						
Lead						370			
Zinc						1890			
Chromium						41.			
Mercury						51.			
Calcium						8.2			

All results are in PPM (mg/L) unless otherwise specified. ND is "None Detected"  
 "<" is "Less Than" and ">" is "Greater Than"